TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: A machine operator died when he was caught between a conveyor belt and tension roller underneath an industrial machine

SUMMARY
California FACE Report #04CA011

A 35-year-old Hispanic machine operator died when he was caught between a tension roller and conveyor belt at work. The victim was attempting to remove some cardboard from the bottom of a conveyor belt when he got caught in the tension roller. The company's lockout/tagout procedure was not in use at the time of the incident, and there was no guarding to protect employees from the moving parts of the machine. The CA/FACE investigator determined that in order to prevent future occurrences, employers, as part of their Injury and Illness Prevention Program (IIPP), should:

- Ensure employees follow lockout/tagout procedures when servicing a machine.
- Ensure employees do not place any part of their bodies into areas where they might become entangled with machinery when it is running.
- Ensure all machines are properly guarded to protect employees from moving parts.

INTRODUCTION

On September 29, 2004, at approximately 5:20 a.m., a 35-year-old Hispanic machine operator died when he got caught between a tension roller and conveyor belt while underneath a machine used to make cardboard sheets. The victim was attempting to clean off some cardboard that was stuck to the conveyor belt when the incident occurred.

The CA/FACE investigator learned of this incident on October 14, 2004, through the Los Angeles County Coroner's post mortem report. Contact with the victim's employer was made on December 14, 2004, and the CA/FACE investigator was referred to the employer's legal counsel. On January 13, 2005, the CA/FACE investigator traveled to the facility where the incident occurred and interviewed the company's management and co-workers of the victim. The machine involved in the incident was photographed and the area where the incident took place was examined.

The employer of the victim was a manufacturer of corrugated cardboard sheets and boxes. The company had been in business for over 30 years and had 230 employees. The facility where the incident took place employed 45 people. The victim had been employed approximately four and a half years with the company when the incident occurred. The victim was born in Mexico

and had been in the United States for nine years. According to his employer, he spoke mostly Spanish on the job and could speak and read some English, but not fluently. The victim's direct supervisor spoke only English, but other supervisors and co-workers spoke Spanish.

The company had a written safety program printed in English. The safety program had generic procedures which included lockout/tagout, but these were not machine-specific. Safety meetings were held monthly and were documented. The company had a training program that provided machine-specific operations training. The training program consisted of a combination of classroom and on-the-job training. Training was measured by giving employees a 30-day period to demonstrate their ability after receiving a specific training. The victim had specific training for the machine involved in this incident. He was given the position of lead man based on his ability and proficiency. Part of his job description was to perform service on this machine.

INVESTIGATION

The site of the incident was a manufacturing plant of cardboard sheets and boxes. The machine involved in the incident was an industrial roller assembly used to make corrugated cardboard sheets. The assembly takes sheets of cardboard and, with the application of heat and an adhesive compound, compresses them together making different arrays of regular and specialty cardboard sheets.

On the day of the incident, the victim and his co-workers were working on an order of cardboard sheets when the cardboard became wrapped around the bottom conveyor belt in the machine. This was a common occurrence according to the victim's co-workers. The machine was shut off by one of the workers. One of the victim's co-workers cleared the cardboard on the top part of the machine, and the victim went underneath the machine and cleared the bottom part. There was no guarding to prevent access to the conveyor. They both moved away from the machine, and then the co-worker gave the signal to start the machine. The supervisor sounded the alarm that signals the machine was starting, and then he started the machine. The supervisor was observing the cardboard going through the machine, and about ten seconds later he heard the victim yell. The co-worker stated that after the machine started he was feeding the cardboard through the machine when he also heard the victim yell.

The supervisor immediately shut down the machine and found the victim underneath the machine, stuck between the conveyor belt and the roller. The supervisor and co-worker both stated that they did not see the victim go underneath the machine after he cleared it the first time. The company's lockout/tagout procedure was not being used at the time of the incident. The co-workers removed the victim from underneath the machine as the paramedics were called. The victim was treated at the scene and then transported to the hospital where his treatment continued until he expired later that morning.

CAUSE OF DEATH

The cause of death, according to the death certificate, was traumatic injuries.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure employees follow lockout/tagout procedures when servicing a machine.

Discussion: Without the benefit of lockout/tagout, employees cannot be assured of their safety when entering a machine, especially when all sources of energy have not been dissipated. The

machine was stopped when repairs were needed by pressing an emergency stop button on the control panel. The machine was never locked out, therefore the moving parts of the machine could start at any time when the employees were on, in, or underneath the machine. Although the company had a lockout/tagout program, it was not being used in this case. Lockout/tagout programs should address the following issues by ensuring:

- That all forms of hazardous energy have been de-energized, isolated, blocked, and/or dissipated before work begins.
- That workers are able to secure energy control devices with their own individually assigned locks and keys, and that there is only one key for each lock the worker controls.
- That the locks used to secure an energy control device be clearly labeled with durable tags to identify the worker assigned to the lock.
- That there is verification by test and/or observation that all energy sources are de-energized before work begins.
- That all workers are clear of danger points before re-energizing the system.
- That there is a hazardous energy control program with any confined-space entry program.

Additionally, employers can encourage manufacturers to design machines and systems that make it easy to control hazardous energy.

Recommendation #2: Ensure employees do not place any part of their bodies into areas where they might become entangled with machinery when it is running.
Discussion: Evidence suggests the victim got back underneath the machine a second time out more cardboard. Employers can enhance worker compliance with safe work practices through programs of task-specific training, supervision, safe work recognition, and progressive disciplinary measures.

Recommendation #3: **Ensure all machines are properly guarded to protect employees from moving parts.**
Discussion: In this incident the victim was performing service on the conveyor system. During servicing, it is a frequent occurrence for guarding to be removed for access. This is permissible as long as the machine has been de-energized and lockout/tagout is used. When the machinery is to be restarted, the guarding must be replaced. If there had been guarding for this machine, and if it had been replaced after the cardboard had been removed from the conveyor system but before the system was restarted, the victim would not have been able to re-enter the incident site with the conveyor running.

References:

California Code of Regulations, Vol. 9, Title 8, Sections 3314 (a) (f), 3999(b), 4002

NIOSH Publication #99-110: NIOSH Alert: Preventing Worker Deaths from Uncontrolled Release of Electrical, Mechanical, and Other Types of Hazardous Energies.

EXHIBITS:

Exhibit 1. The machine involved in the incident.

Exhibit 2. The location where the victim went underneath the machine with guards in place after the incident.

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. NIOSH-funded, state-based FACE programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

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